

**REMARKS**

In response to the Office Action dated December 18, 2002, claims 27-38 are added. Claims 1, 2 and 4-38 are now active in this application. No new matter has been added.

The Examiner objects to the drawings as not showing said carrier generation/multiplication layer is prevented from holes flowing out thereof, and is prevented from electron injection thereto (claim 4), and said carrier generation /multiplication layer is prevented from electron flowing out thereof, and is prevented from hole injection thereto (claim 7).

Consequently, Fig. 4 is amended, as shown in the attached marked-up copy of Fig. 4.

**REJECTION OF CLAIMS UNDER 35 U.S.C. § 103**

**I.** Claims 1, 4, 6, 7, 11, 15, 16, 20, 25 and 26 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nakayama et al. (U.S. Patent No. 6,157,072; hereinafter, Nakayama) in view of Takasaki et al. (U.S. Patent No. 4,980,736; hereinafter, Takasaki), Kobayashi et al. (U.S. Patent No. 6,476,867; hereinafter Kobayashi) and Sugawa (U.S. Patent No. 5,869,850).

**II.** Claims 2, 5, 17, 18, 23 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nakayama in view of Takasaki, Kobayashi and Sugawa as applied to claims 1, 4, 6, 7, 25 and 26 and further in view of Deane et al. (U.S. Patent No. 6,064,091; hereinafter Deane).

**III.** Claims 8-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nakayama in view of Takasaki, Kobayashi and Sugawa, as applied to claims 1 and 4 above, and further in view of Anagnostopoulos (U.S. Patent No. 5,563,404), Ota (U.S. Patent No. 4,496,981) and Waki et al. (JP 01-311511; hereinafter Waki).

**IV.** Claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nakayama in view of Takasaki and Sugawa, as applied to claim 4, and further in view of Fukuda et al. (U.S. Patent No. 5,635,327; hereinafter, Fukuda).

**V.** Claims 13, 14 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nakayama in view of Takasaki, Kozuka et al. (JP 09-102627; hereinafter Kozuka), and Kobayashi.

**VI.** Claims 21 and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nakayama in view of Takasaki.

**VII.** The rejection of claims 1, 2, 4-20 and 23-26, listed above in sections **I-VI** are respectfully traversed.

The present invention generally relates to the layered structure of photoelectric conversion device. More specifically, as recited in the independent claims, the photoelectric conversion device essentially comprises I-a-Si layer sandwiched by p-a-SiC layer and n-a-SiN.

The Examiner relies Nakayama and refers to a paragraph of column 20, lines 34-46 of this reference, as showing a SiN layer. However, in this paragraph, usable examples as the semiconductor, as a whole, are listed and the a-SiN is merely introduced as one example therefor, but **NOT** for the specific layer of n-type a-SiN. That is, there is no teachings in this reference regarding the specific combination of layers of p-type a-SiC, a-Si, and n-type a-SiN, as recited in the present claims.

As to Takahashi, Kobayash, Sugawa, Deaane et al, Anagnostophulos, Ota, Waki, Fukuda and Kozuka, none of these references disclose or suggest the deficiency of Nakayama, identified above. Therefore, even if the teachings of Takahashi, Kobayash, Sugawa, Deaane, Anagnostophulos, Ota, Waki, Fukuda and Kozuka were somehow combined with the disclosure of Nakayama, the claimed invention does not result.

As to the Examiner using Sugawa as a prior art teaching of the claimed limitation regarding energy levels by referring to Figures 6 and 7, Applicants wish to point out that, contrary to the Examiners finding, Figures 6 and 7 do **NOT** teach the claimed limitation regarding energy levels.

As to Deane, this reference does not relate to photoelectric conversion device and does not disclose a sandwich structure. Therefore, this reference is not relevant to the claimed invention.

As to the rejection of claims 21 and 22 listed above in section VI, the Examiner admits that Nakayama does not disclose the inhibiting layer on only a substrate. However, the Examiner maintains that Takasaki further teaches the inhibiting layer (Fig. 1A, #15) on only a substrate (Fig. 1A, #16). Thus, the Examiner contends it would have been obvious to a person of ordinary skill in the art to have the inhibiting layer on only a

substrate of Takasaki with the device of Nakayama, since one would be motivated to place the inhibiting layer on something like a substrate for support as implied from Fig. 1A of Takasaki.

In Fig. 1A of Takasaki, blocking layer 15 is formed on electrode 16 which is formed on substrate 11. This is the same structural arrangement shown in Fig. 3 of Nakayama. Thus, modifying the device of Nakayama in view of the teaching of Takasaki results in the exactly the same structural arrangement already disclosed in Nakayama.

**VIII.** In view of the above, claims 1, 2 and 4-26 are patentable over Nakayama, Takahashi, Kobayash, Sugawa, Deaane et al, Anagnostophulos, Ota, Waki, Fukuda and Kozuka, considered alone or in combination. Therefore, the allowance of claims 1, 2 and 4-26 is respectfully solicited.

#### **NEW CLAIMS**

New claims 27-34, depending respectively from claims 1, 4, 6, 7, 13, 14, 16 and 19, are submitted. Each of the new dependent claims 27-34 clarifies that the n-a-SiN is hydrogenated (hydrogenated n-a-SiN).

#### **CONCLUSION**


Accordingly, it is urged that the application, as now amended, is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

09/704,539

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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